

1 **The Anatomical Society's Core Anatomy Syllabus for Undergraduate Nursing**

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1 **Abstract**

2 The Anatomical Society has developed a series of learning outcomes in consultation with
3 nursing educators delivering anatomical content to undergraduate (preregistration) nursing
4 students. A Delphi panel methodology was adopted to select experts within the field that would
5 recommend core anatomical content in undergraduate nursing programmes throughout the UK.
6 Using the Anatomical Society's Core Gross Anatomy Syllabus for Medical Students as a
7 foundation, a modified Delphi technique was used to develop discipline specific outcomes to
8 nursing graduates. The Delphi panel consisted of 48 individuals
9 (n = 48) with a minimum of 3 years' experience teaching anatomy to nursing students,
10 representing a broad spectrum of UK Higher Education Institutions. The output from this study
11 was 64 nursing specific learning outcomes in anatomy that are applicable to all undergraduate
12 (preregistration) programmes in the UK. The new Core Anatomy Syllabus for Undergraduate
13 Nursing offers a basic anatomical framework upon which nurse educators, clinical mentors and
14 nursing students can underpin their clinical practice and knowledge. The learning outcomes
15 presented may be used to develop anatomy teaching within an integrated nursing curriculum.

16

17 **Introduction**

18 The World Health organisation define nursing as: "encompassing autonomous and collaborative
19 care of individuals of all ages, families, groups and communities, sick or well and in all settings.
20 It includes the promotion of health, the prevention of illness, and the care of ill, disabled and
21 dying people" (WHO Europe pg. 5: 2009).

22

1 There are four main divisions of nursing taught at undergraduate level in the UK; Adult nursing:
2 the care of people aged 18 or over; Children's nursing: the care of children and young people
3 from birth to late adolescence; Learning disabilities nursing: the care of people of all ages who
4 have learning disabilities; Mental health nursing: the care of people of all ages who have mental
5 health problems (NMC 2010 pg. 147).

6
7 Despite the existence of these distinct branches of nursing, a knowledge, understanding and
8 application of human anatomy alongside other basic sciences, collectively known as 'biosciences'
9 falls under the remit of generic competency which all undergraduate nurses must be able to
10 demonstrate by the end of the bachelor's degree programme.
11 (NMC 2010 pg. 95 & 147)

12
13 The biosciences required by nurses are anatomy, physiology, biochemistry, pathology,
14 pathophysiology, genetics, microbiology, pharmacology and biophysics. A working knowledge of
15 these areas is deemed to be required for safe and competent practitioners (WHO 2009 & NMC
16 2010).

17
18 With regards to anatomical knowledge and understanding, at present, the guidance by the UK
19 Nursing and Midwifery Council (NMC) to nurse academics teaching within accredited nursing
20 programmes simply states that a knowledge, understanding and application of human anatomy is
21 essential to ensure eligibility to register to practice upon graduation (NMC 2010). Despite anatomy
22 being deemed a fundamental requirement for safe clinical practice, there is evidence since 1980
23 documenting a widespread 'bioscience problem' affecting anatomy and other elements of nursing

1 education, both nationally Nicoll & Butler 1996; Jordon 1999; Clancy et.al., 2000; Davies 2010;
2 Smales 2010; Taylor et.al., 2015; Andrew et.al., 2015) and internationally (Akinsanya & Hayward
3 1980; Friedel & Treagust 2005; Craft et.al., 2013).

4
5 When the studies were cross-matched, and compared they revealed common and consistent
6 findings in student's anxiety and low self-confidence in learning and applying bioscientific
7 knowledge, due to a suspected lack of conceptualisation. Anecdotal reports from students and
8 teaching staff have attributed these issues to a lack of sufficient learning and teaching time for
9 bioscience subjects, including anatomy (Jordon et.al., 1999; McVicar et.al., 2015; Taylor et.al.,
10 2015). This may be further complicated by a lack of confidence displayed by many clinical
11 mentors with regards to integrating bioscientific principles to clinical practice (Molesworth &
12 Lewitt 2015). Despite this, nursing students have highlighted a fundamental knowledge in
13 anatomy as an important element of their practice (Meskell & O'Connor 2007).

14
15 Several previous studies have attempted to address deficits in bioscience education by
16 implementing and investigating various pedagogical approaches (Davies et.al., 2000, Green
17 et.al., 2000 & 2006, Koch et.al., 2010, Al-Modhefer & Roe 2010, Efsthious & Bailey 2012,
18 Craft et.al., 2016, Montayre 2017) while others focused on natural science entry requirements as
19 key performance indicators (McKee 2002 & Van Rooyen et, al., 2006). However, the existing
20 body of evidence is largely based on data gathered across only one or two sites per study,
21 compromising generalisability and maximising the likely impact of local influencing factors
22 (Andrew et, al.,2015). Taken together, this has led to the conclusion that student's' difficulty in
23 learning and assimilating biosciences is due, at least in part, to a lack of explicit guidelines from

1 the NMC, thereby creating widespread geographical variability in curricular content and delivery
2 (McVicar et.al.,2010 & Taylor et.al., 2015).

3
4 In response to the need for enhanced integration and to address the bioscience issue, the Bioscience
5 in Nursing Education group (BiNE) was established by the Higher Education Academy (HEA) to
6 create a quality assurance framework for bioscience education in nursing. The BiNE (2016)
7 framework incorporates a list of broad learning objectives spanning across anatomy, physiology,
8 biology, pathophysiology, pharmacology and genetics. Although this framework has provided
9 additional clarity, the term 'Bioscience' remains broad, leading to issues with identifying and
10 resolving problems specific to scientific domains.

11
12 To counter the lack of subject specific guidelines, particularly with respect to anatomy, we
13 sought to develop the first national advisory, core anatomy syllabus, for undergraduate nurses.
14 Subject specific learning outcomes have been shown to be effective for curriculum design,
15 teaching and learning, and developing assessment. Additionally, anatomy specific outcomes can
16 assist greatly in the systematic design of integrated modules and programmes (Biggs & Tang
17 2007 & Kennedy et.al.,2009).

18
19 The NMC and the General Medical Council (GMC 2009) endorse the development of transparent
20 educational standards that can provide clarity on areas where educational integration can be
21 facilitated across health and social care to reflect the integrated, multiprofessional dynamic in
22 modern healthcare service delivery (NHS Scotland 2007, NMC 2017, NHS Scotland 2014-15).
23 This is also supported by disciplines allied to health education as exemplified by the Anatomical

1 Society and International Association of Anatomists creation of advisory core syllabi to provide a
2 high quality “common-sense” approach to anatomical teaching and learning (McHanwell et.al.,
3 2007; Smith et.al., 2016; Moxham et.al., 2017).

4

5 The Anatomical Society’s syllabi project in medicine, dentistry, pharmacy has engaged with
6 stakeholders in each respective field to produce explicit advisory guidance on anatomy learning
7 outcomes. The rationale for developing discipline specific core anatomy syllabi is a response to
8 the reduction of anatomical teaching hours across all healthcare disciplines and to provide
9 transparent and detailed guidance on the level of anatomical content expected at the point of
10 registration. The outcomes presented here for nursing have been developed by life science nurse
11 educators, with consensus analysis facilitated by the Anatomical Society thereby aiming to
12 minimise variability by providing a coherent content guide to assist anatomical teaching and
13 learning.

14

15 The recommended core anatomy presented below consists of a list of defined learning outcomes,
16 arranged by systems. Table 1 provides contextual information to guide curriculum planners and
17 teachers with the implementation and integration of the syllabus outcomes into the curriculum in
18 a number of ways, outlined below. The list is illustrative as opposed to exhaustive. Additionally,
19 the contextual information will assist nurse educators signpost the clinical relevance of the
20 anatomy to students. It can also be used by clinical mentors when integrating theoretical
21 knowledge into practice to provide clinical context. Finally, it serves to aid mapping learning
22 outcomes and assessment throughout the pre-registration nursing curriculum.

23



1 **Ethical approval**

2 The study was granted ethical approval from the University of Edinburgh’s Health and Social
3 Science ethical committee from the school of nursing (Reference No: NURS021).

5 **Method**

6 The established Delphi process used for the formation of the Anatomical Society’s Core
7 Regional Anatomy Syllabus for Undergraduate Medicine (McHanwell et.al., 2007; Moxham
8 et.al., 2014 & Smith et.al., 2016a) was adopted for this study. The delphi process is a consensus
9 method that systematically facilitates and structures communication between experts, to ascertain
10 collective agreement, on a single issue, through reiterated survey rounds (Keeney et.al., 2011, Ab
11 Latif et.al., 2016 & Smith et.al., 2016b). The delphi process outlined in Smith et.al., (2016b) was
12 modified to include a pilot panel of nurse educators, anatomists and clinical educational experts
13 (n=9). The role of the pilot panel was to screen the Anatomical Society’s Core Regional
14 Anatomy Syllabus for Undergraduate Medicine (Smith et al., 2016) for applicability to nurses,
15 based upon the recommendations within the (BiNE 2016) framework. BiNE advised that nursing
16 programmes undertake a system based approach to designing and delivering anatomical content.
17 To ensure the format and phraseology of the syllabus was pertinent to a wider nurse educator
18 audience the pilot panel were asked to use the ‘accept’, ‘reject’ ‘modify’ and/or ‘comment’
19 structure on each intended learning outcome to reflect the design of the online survey, prior to
20 the learning outcomes national circulation.

21
22 A UCAS search identified 76 higher education institutions (HEI) that delivered accredited
23 nursing programmes. A purposive sample of life science lecturers, senior lecturers, professors,

1 associate professors or deans with a minimum of three years' anatomy teaching experience in
2 undergraduate nursing programmes were then invited to participate by email, along with a
3 participant information sheet and consent form. Participants were invited to partake over two
4 rounds. In phase one participants were asked to 'accept', 'reject' or 'modify' with open
5 comments to refine the intended learning outcomes whereas phase two sought a final consensus,
6 with options to 'accept' or 'reject' with typographic changes only. 69 of the 76 HEI's were
7 contacted to partake. Pilot panellist institutions (n=4) were excluded from undertaking the online
8 survey. 5 had no staff directory on their websites and did not respond to telephone calls. Of the
9 69 HEI's contacted, 48 individuals from 35 HEI's took part in the online survey. There was a
10 total of 57 panellists including pilot phase experts and national participants from 38 HEIs across
11 the UK. One professor; one associate professor; one associate dean; forty-one senior lecturers';
12 six teaching fellows and seven registered nurses participated. 68.09% of survey participants
13 reported ten years plus experience teaching anatomy to undergraduate nursing students. The
14 panellists agreed on the presented final core syllabus in anatomy for undergraduate nursing
15 students.

16

17 **The Syllabus**

18 **Anatomical Terminology**

- 19 1. Define the following terms relative to the anatomical position: Anterior/ventral,
20 posterior/dorsal, superior, inferior, medial, median, lateral, proximal, distal, superficial,
21 deep, prone, supine, palmar & plantar.

22

- 1 2. Describe the following anatomical planes: Axial/transverse/horizontal, sagittal'/vertical
2 plane and the coronal/frontal' plane.
3
- 4 3. Define and demonstrate the terms used to describe movement: Flexion, extension,
5 abduction, adduction, medial rotation, lateral rotation, inversion, eversion, supination,
6 pronation, plantar-flexion, dorsi-flexion, and circumduction.
7
- 8 4. Compare and contrast the systematic changes associated with growth and ageing in
9 children, adults and the elderly
10
- 11 5. Identify the major surface and bony landmarks in each body region
12 (e.g. occipital protuberance, orbital ridge, nasal bones, mastoid process, cervical to
13 sacrococcygeal vertebrae and associated joints, shoulder girdle and upper limb, sternal
14 region, ribs and costal margin, pelvic girdle and lower limb).
15

16 **Histological Overview**

- 17 6. Identify and describe the components of a basic cell.
18
- 19 7. Identify and describe the features of epithelial tissues (simple squamous, stratified
20 squamous, transitional, cuboidal, columnar and ciliated)
21
- 22 8. Identify and describe the general structure of a neuron
23

1 9. Describe and contrast different types of cartilage (hyaline, fibrocartilage and elastic
2 cartilage)

3
4 10. Compare and contrast the structural features of skeletal, smooth and cardiac muscle.

5
6 11. Describe the role of connective tissues.

7
8 **Nervous System and Special Senses**

9 12. Define and describe the major divisions of the central nervous system (CNS), peripheral
10 nervous system (PNS) and autonomic nervous system (ANS).

11
12 13. Identify the major divisions of the brain: The forebrain (cerebral hemispheres), The
13 midbrain (amygdala, thalamus, hypothalamus, hippocampus, pituitary gland, pineal gland
14 and crus cerebri), the brainstem/hindbrain (pons, medulla oblongata and cerebellum).

15
16 14. Describe the difference between grey matter (e.g. nuclei, cortex, and basal nuclei/ganglia)
17 and white matter (association, commissural and projection fibres and the corpus
18 callosum).

19
20 15. Identify the position of the frontal, parietal, temporal and occipital lobes and the major
21 sulci/landmarks that separate them

22

1 16. Identify and briefly describe the cerebral cortex in relation to its functions, namely:

2 motor; sensory; visual; auditory; speech; memory and emotion; decision making, social
3 behaviour.

4
5 17. Describe the structural differences between the 3 layers of meninges (dura, arachnoid and
6 pia) and their relationship to the brain and spinal cord.

7
8 18. Name the twelve cranial nerves and summarise their major functions in relation to PNS
9 innervation

10
11 19. Describe the ventricular system and the formation, circulation, drainage and role of
12 cerebrospinal fluid.

13
14 20. Describe the general organisation of the outer, middle and inner ear.

15
16 21. Describe the structure of the eye, eyelid, conjunctiva, and lacrimal gland. Explain their
17 importance for the maintenance of corneal integrity.

18
19 22. Describe the structure of the spinal cord, a typical spinal nerve and a reflex arc and its
20 relation to the vertebral column.

21

22

23

1 **Musculoskeletal System**

2 23. Identify the major bones that make up the axial and appendicular skeleton and summarise
3 their main differences.

4

5 24. Outline the main differences between compact and cancellous bone.

6

7 25. Describe and contrast different types of joints (synovial, fibrous and cartilaginous) and
8 their associated structures (cartilage, tendons, ligaments, bursa) in relation to movement
9 and stability.

10

11 26. Name and describe the major muscles groups of the head, neck, thorax, abdomen, pelvis,
12 upper limb and lower limb

13

14 27. Identify the main curvatures and features of the vertebral column, individual vertebrae
15 (cervical, thoracic, lumbar, sacral and coccygeal) and intervertebral joints.

16

17 **Integumentary System**

18 28. Describe the epidermis, dermis & subcutaneous layers of the skin and appendages (hair
19 follicles, sweat glands, nails).

20

21 29. Summarise the contribution of the dermatomes in sensory perception and referred pain.

22

1 **Cardiovascular System**

2 30. Identify and describe the position of the heart in the mediastinum relative to the
3 associated structures

4
5 31. Describe the four chambers of the heart (external and internal features), its specialised
6 conduction network and the fibrous and serous layers of the pericardium.

7
8 32. Compare and contrast the structure and location of the valves of the heart.

9
10 33. Describe the origin, course and main branches of the left and right coronary arteries and
11 describe their location relative to the heart, and the general area of the heart that they
12 supply.

13
14 34. Distinguish the structural differences between arteries, veins and capillaries.

15
16 35. Define and demonstrate the structures of the pulmonary and systematic circulation.

17
18 36. Identify and describe the course and important relationships of the major arteries and
19 veins of the trunk, with emphasis on the aorta, superior vena cava and inferior vena cava,
20 their major branches and associated pulse points.

21
22 37. Define the deep and superficial veins and outline the course of the main veins of the
23 upper limb and lower limb.

1 38. Identify and describe the blood supply and venous drainage of the brain and its
2 association to the great vessels of the heart and neck.

3
4 39. Identify and describe the hepatic portal-venous system

5
6 **Respiratory System**

7 40. Identify the associated joints and muscles of respiration (accessory and intercostals
8 muscles and thoracic joints i.e. components of the sternum, ribs and costal cartilage
9 articulations), and examine their contribution to the mechanism of breathing.

10
11 41. Identify and describe the major features of the external nose, the nasal cavity, the
12 pharynx, the larynx and the trachea

13
14 42. Describe the major features of the diaphragm, pleural layers and the lungs (lobes and
15 fissures of the right and left lungs; bronchi, bronchioles, alveoli; and surface landmarks).

16
17 43. Identify and describe the course and role of the phrenic nerve in maintaining normal
18 breathing.

19
20 **Gastrointestinal System**

21 44. Describe the major features of the oral cavity including the teeth, tongue, soft and hard
22 palate.

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45. Describe the salivary glands (parotid, submandibular and sublingual) and their relationship to the oral cavity for digestion
46. Identify and describe the structure of the oesophagus and explain the role of the epiglottis in demarcating the respiratory and digestive tracts.
47. Describe the relationship of the abdominal organs to the peritoneum (parietal and visceral layers) and the intestinal mesenteries.
48. Identify and describe the regions of the stomach.
49. Identify and describe the major sphincters of the gastrointestinal system in relation to their associated structures (oesophageal sphincter, cardiac sphincter, pyloric sphincter, ileocaecal sphincter, hepato-pancreatic sphincter, anal sphincters).
50. Identify and describe the constituent parts of the small intestine (duodenum, jejunum, and ileum) and the large intestine (caecum, ascending colon, transverse colon, descending colon, sigmoid colon, rectum and anus).
51. Compare and contrast the composition of the walls of the small and large intestines.

1 52. Identify and describe the lobes and major ligaments of the liver, the anatomy of the
2 gallbladder, the anatomy of the pancreas and its associated ducts, and their position
3 relative to the intestines.

4
5 53. Identify the four quadrants and nine descriptive regions of the abdomen in relation to
6 underlying organs

7
8 **Urinary System**

9
10 54. Identify and describe the main differences between the male and female urinary systems.

11
12 55. Describe the position of the kidneys and adrenal glands in relation to adjacent structures.

13
14 56. Identify and describe the external and internal structure of the kidney and the relationship
15 to the associated structures.

16
17 57. Describe the position of the bladder relative to associated structures in males and females
18 (including during pregnancy).

19
20 **Reproductive System**

21 58. Identify and describe the differences between the male and female reproductive systems
22 (organs, glands, external genitalia and pelvic characteristics).

1 59. Describe the anatomy of the pelvic diaphragm and perineum and their relationship to the
2 neurovascular structures that supply these regions in males and females.

3
4 60. Describe the structure and composition of the breast.

5
6 61. Describe the anatomical changes that occur during pregnancy.

7
8 **Lymphatic System**

9 62. Describe the drainage of lymph throughout the body

10
11 63. Identify the primary (bone marrow & thymus) and secondary lymphoid (lymph nodes,
12 spleen, tonsils and appendix) organs and tissues of the lymphatic system.

13
14 **Endocrine**

15 64. Identify the major endocrine structures (hypothalamus, anterior and posterior lobes of the
16 pituitary gland, pineal gland thyroid gland and parathyroid glands, thymus, adrenal gland,
17 pancreas, gonads, skin, heart, kidneys, gastrointestinal tract and liver).

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Learning Outcome	Clinical Context
Anatomical Terminology	
1	Position and relationship of anatomical structures. To describe patient positioning. Descriptors for the location of injury and pain. Keeping accurate records and interpreting documentation from other healthcare team disciplines.
2	Joint movement and related injuries.
3	Assessment and monitoring of normal and compromised movement: musculoskeletal injuries, rheumatic disease, post-procedural/operative care of arthroscopy, orthopaedic and spinal. Impact on activity of daily living assessment. Pain assessment.
4	Normal development vs developmental anomalies Effects of adverse health behaviours on anatomical structures throughout the lifespan e.g. smoking, excessive alcohol intake Systems based structural gerontological considerations correlated to pathology, physiological homeostatic adaptation and pathophysiology i.e. vasculature changes, loss of bone density, detrusor muscle instability etc. Drug dosage adjustments and modified calculations Choice of medication administration route in different patient populations.
5	Care of pressure areas and prevention of pressure ulcers. Assessment of pressure ulcer grade 1 to 4. Landmarks for intramuscular injection (IM) i.e. humeral head for deltoid injection and the anterior superior iliac spine for gluteus medius injection.
Histological Overview	
6	Homeostatic mechanisms, pathophysiology and pharmacological interventions.
7	Physiological: endocrine secretions, bladder and uterus expansion, protection from abrasion, absorption and transport. Clinical: Mucosal membrane assessment, oral lesions, carcinoma, granulation in wound care.
8	Anatomy. Physiology. Pathology. Pathophysiology. Pharmacological Action.
9	Support, protection and mobility. Cartilage injuries and healing.
10	Types of contraction i.e. voluntary/involuntary
11	Supportive and protective role in relation to gross structures, extracellular fluid spaces, blood, immunity. Autoimmune disorders i.e. Lupus erythematosus.
Nervous System	
12	Vital sign regulation, pain, reflexes, sensory and motor function throughout the body. Somatic sensory pathology i.e. shingles, motor neurone disease, multiple sclerosis.

13	Vital sign 'control centres' i.e. temperature regulation (hypothalamus) baroreceptors (pons) and chemoreceptors (medulla oblongata), Pituitary Tumours, Schizophrenia (Limbic system)
14	Parkinson's disease, Aminergic and Cholinergic Systems and related pharmacology, Gait, Balance, Coordination, Muscle Tone (i.e. Hypotonia)
15	Relate to special senses Neurodegeneration e.g. Dementia Effects of stroke on various brain regions e.g. Dysarthria. Neuropsychiatric disorders and intellectual disability
16	Relate to corresponding regions of the brain and assessment and interventions to for activities of daily living
17	Blood-brain barrier, meningitis, subdural and extradural haemorrhage/haematoma.
18	Anosmia (Lack of smell affects appetite); blindness; diplopia (double vision); trigeminal neuralgia (Facial Pain and Spasm); Bell's palsy; hearing loss; tinnitus; dizziness; dysphagia. Cranial Nerve abnormalities may be indicative of cervical spine and/or brainstem pathology/injury
19	Hydrocephalus, raised intracranial pressure related to consciousness.
20	Infection i.e. otitis media, labyrinthitis, dizziness and loss of balance. Administering ear drops.
21	Conjunctivitis, cataracts, glaucoma, red eye, administering eye drops, basic eye care, Glasgow Coma Scale (GSC) pupil assessment.
22	Reflex and pain, post care and education of a lumbar puncture, cauda equina.
Musculoskeletal System	
23	Normal and abnormal integrity, fractures, osteoporosis
24	Bone marrow, immunity, pre-and post-care of bone marrow aspirate and stem cell transplants.
25	Mobility, moving and handling, sprains, arthritis, tendonitis, bursitis's, nerve impingement, rotator cuff injury i.e. frozen shoulder, carpal tunnel syndrome.
26	Neurovascular monitoring, myalgia, compartment syndrome, administration of intramuscular injection/safe sites, assessment of mobility, gait, muscle tone and general action that impact on functional activities such as sitting, standing, lying, lifting and exercising. Rehabilitation, multidisciplinary communication, interpreting and supporting physiotherapy instructions, falls prevention.
27	Quadriplegia, paraplegia, lordosis, kyphosis, scoliosis, moving and handling, pressure ulcer care.

Integumentary System

- 28 Cellulitis, burns, inflammation, decreased turgor in dehydration, skincare, assessment and medical referral of suspicious moles for skin cancer, topical medication.
- 29 Anaesthetic action, referred pain i.e. cholecystitis pain referred to the left shoulder via the phrenic nerve at level C3/4/5 due to diaphragmatic irritation. Monitoring diminished sensation post operatively i.e. Pain controlled analgesia (PCA) in situ, paraesthesia.
-

Cardiovascular System

- 30 Palpation of apex heartbeat, Electrocardiogram (ECG) electrode placement.
- 31 Normal heart rhythm, blood pressure, cardiac output, arrhythmias, pericarditis, pericardial effusion, cardiac tamponade, care of pacemakers, heart failure, patent foramen ovale, septal defects, ECG, cardiac monitoring, cardioversion.
- 32 Mechanism of circulation, rheumatic fever, endocarditis, cardiac valve insufficiencies i.e. mitral valve regurgitation, aortic/pulmonary stenosis.
- 33 Ischemic heart disease i.e. myocardial infarction, stable/unstable angina. Pre-and post-operative angiogram/ Percutaneous coronary intervention (PCI) pre-intra and post care.
- 34 Circulatory function i.e. oxygenation, deoxygenation and diffusion.
- 35 Circulatory function in chronic obstructive pulmonary disease (COPD) and right sided heart failure, pulmonary oedema and effusion, pulmonary embolism.
- 36 Atherosclerosis, visceral ischemia/Infarct, aortic aneurysm, thrombus and embolism, peripheral venous disease (PVD) and peripheral arterial disease (PAD) – compression bandaging and care of PVD/PAD ulceration. Blood pressure, profusion (i.e pallor, central and peripheral cyanosis/mottling), wound healing.
- 37 Intravenous drug administration, cannulation, phlebotomy, phlebitis, varicose veins, deep vein thrombosis,
- 38 Stroke, headache, haemorrhage, care of central lines.
- 39 Portal hypertension
-

Respiratory System

- 40 COPD, acute respiratory distress syndrome, asthma, pneumothorax, flail chest.
- 41 Airway management, epistaxis, laryngitis, pharyngitis, tracheostomy care, airway suction.
- 42 Normal and abnormal respiration i.e. tachypnoea, hypoventilation, Upper and lower respiratory chest infections i.e. pneumonia
-

	Pleurisy pre, intra and post-operative care of Lobectomy Administration of oxygen/nebulisers and/or inhalers Peripheral oxygen monitoring aka SpO2 Monitoring.
43	Unstable cervical spine trauma at C3/4/5, Quadriplegia, Phrenic nerve palsy, assessment of bilateral chest movement.
Gastrointestinal System	
44	Oral lesions, candida, sublingual drug administration, oral hygiene.
45	Bolus formation, xerostomia, mumps, autoimmune disorders that affect salivary secretions i.e. HIV
46	Swallowing, aspiration, nasogastric (NG) insertion, feeding and after care.
47	Peritonitis, post-operative adhesions and abdominal pain, abdominal and inguinal hernia's.
48	Digestion, absorption, NG placement, ulceration (hematemesis), gastric dumping.
49	Peristalsis, gastro-oesophageal reflex disease (GORD), referred epigastric pain, the composition and flow of bile and pancreatic juices and faecal incontinence.
50	Bowel obstruction, resection and stoma care, Crohn's disease, ulcerative colitis, colorectal abscess.
51	Nutritional and drug absorption, stool colour and formation, constipation/diarrhoea, excretion.
52	Hepatitis, cirrhosis, jaundice, cholecystitis, cholelithiasis, pancreatitis, drug and alcohol metabolism, overdoses, liver failure.
53	Abdominal and/or pain assessment, record keeping and multidisplinary communication.
Urinary System	
54	Urinary catheterisation, urinary tract infections.
55	Vascularisation of the kidney, nephrectomy, polycystic kidney disease, flank pain.
56	Creation of urine and metabolic properties for urinalysis, blood pressure regulation, drug metabolism i.e. diuretics. Acute and chronic kidney injury, dialysis.
57	Urinary frequency/retention. Prostate hyperplasia/cancer.
Reproductive	
58	Sexual and reproductive health and disease. Can also be used to distinguish differences between sex and gender in the broader curriculum.

59	Continence and incontinence, urinary retention, rectal and vaginal prolapse, sexual function and dysfunction. Kegel exercises post-partum.
60	Lactation, breast cancer, pre and post-operative care of breast biopsy, mastectomy, breast reconstruction.
61	Normal and abnormal stressors and associated homeostatic changes.
Lymphatic System	
62	Lymphoedema, primary and secondary malignancy.
63	Immunity and infection – related to microbiology and pharmacology
Endocrine	
64	Neurotransmitter and hormonal pathophysiology.

1 **Table 1: Contextual information to support the integration of outcomes into the**
2 **curriculum.**
3

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